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IMMUNITY vs. SUSCEPTIBILITY TO DENTAL CARIES

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From the earliest reported records on Dentistry, five thousand years ago, the Egyptians foremost thought was along the line of prevention of dental caries. From that time to the present, the ideal of prevention has remained uppermost in all writings pertaining to dentistry.

Today the verdict of Science, after most exhaustive research, is that while much is known concerning the subject, little is clearly understood. In the last years of his work, Miller — discoverer of the chemico-bacterial aspects of the dental caries problem — expressed the universal sentiment when he made the following statement: "I can see *how* caries occurs, but not *why.*"

In the tangle of theories and evidence at hand, we are left in a maze of perplexity as to the course of investigation remaining to pursue. Theories have apparently fallen before facts which have bewildered Science again and again. Years ago Head, in his experimentations, found that a tooth so softened by a weak lactic acid solution that it could be cut with a knife, upon immersion again in normal saliva, returned to its original hardness! He said: "I cannot explain it; I am simply dumbfounded."

There is so little understanding of a practical nature that it appears that the underlying principle of Immunity itself must be lacking, or at least has been generally overlooked. This may hold the very "key" to the entire problem.

The basic problem underlying both immunity and susceptibility to dental caries is rendered comparatively simple when two attending local physiological factors, in addition to the bacterial aspects, are clearly understood: (1) The ability of normal saliva, under normal conditions, to protect the teeth effectively against caries; (2) the perverting influence of refined-sugar concentrates in breaking down salivary resistance and defense, thereby promoting fermentative processes, bacterial activity and propagation; and thus virtually inviting caries development. While sugar has long been recognized as a prominent contributing cause of dental caries, its definite and complete relationship appears to have been largely overlooked.

(1) In immunity, the most fundamental natural protector of the teeth against the occurrence of caries is *normal saliva,* in chemico-physiologic equilibrium. Such saliva has the inherent power — through the digestive enzymes and the alkaline salts contained — to digestively cleanse the teeth of adhering starchy debris; prevent formation of dangerous dental plaques, and neutralize any existing oral acids. Normal saliva may even harden or "remineralize" carious teeth and thereby arrest decay, as evidence has clearly proven.

(2) Under susceptible conditions, dental caries appears to have its very inception, fundamentally, in a disturbance or even perversion of the salivary function, whereby the saliva becomes unable to achieve the normal protection mentioned above — a functional disturbance that may be traced almost invariably to the perverting influence of continuous over-ingestion of refined-sugar combinations, as disclosed by the following physiological data:

Sugar foods, when consumed in considerable quantities or in concentrated forms, tend to irritate the mucous membranes of both mouth and stomach, stimulating the salivary mucous glands to an abnormal secretion of heavy, viscid, "ropy" mucous as a counter-irritant, thus rendering the bathing action of the saliva sluggish and the alkaline salts ineffective in their penetrative and neutralizing role. Sugar cannot be digested by salivary enzymes; yet it has the further perverting ability to inhibit the action of the ptyalin itself (which normally digests starchy debris), thus largely nullifying the protection to the teeth which the digestive action of the ptyalin normally affords, and so permitting fermentation of carbohydrate debris to occur, with the resultant dental-caries development.

While refined sugar foods have a legitimate place in the modern diet, the continuous, over-ingestion of such foods of so highly stimulating nature are attended with such deteriorating physiological disturbances as are manifested by the almost universal prevalence of dental caries in this country, and the increasing tendency to diabetes — with an average per capita consumption of refined sugar of over 110 pounds per year.

Except when used in decided moderation, refined-sugar concentrates likewise tend to pervert the appetite for the natural "protective" foods upon which systemic nutrition and vitality so largely depend. All unrefined carbohydrates are fundamentally "protective" foods — fruits, vegetables, wholemeal cereal products, etc. — Nature's colloidal blendings of starches, sugars, fats, resins, alkaline salts, vitamines, digestive enzymes, non-adherent fibre and cellulose, together with other essential elements which unite to protect both dental health and bodily health, chemically, physiologically and prophylactically. When we disregard Nature's plans and principles of nutrition by depending too largely upon refined and de-natured foods, in just that proportion does Nature seem to abandon us by withdrawing her basic protection. Particularly is this true in regard to our teeth, which have no direct defense against oral acids except that provided by normal saliva, and by foods yielding alkaline reserves.

It is well known that all individuals do not react the same to sugar foods. Relative immunity and susceptibility to dental caries appear to depend on many modifying factors: (a) systemic alkaline reserves for salivary requirements; (b) physical activity; (c) state of general health and vitality; (d) systemic tolerance for concentrated, refined carbohydrates, and the ability to assimilate them; (e) degree of concentration of the sugar factor especially, and the amount consumed; (f) proportions of refined sugar and starches ingested, and frequency of use of sugary foods, particularly between regular

meals, as so commonly occurs in the eating of candies especially. These factors not only largely determine whether teeth will erupt structurally sound — free from pit-and-fissure lesions — but also whether those teeth will maintain their integrity throughout adult life, or succumb to the attacks of caries.

ORTHODONTIC APPLIANCES OF FIRST PERMANENT MOLAR*

L. M. Waugh, D.D.S. F.A.C.D.

TRUTH is the basis of progress. As leaders strive for and make progress, it sometimes happens that they have so much outdistanced their colleagues that truths, newly proven, are viewed with skepticism and indeed, sometimes rejected at first. This is the unfortunate and vexed predicament of orthodontics today. As a result, practices are prevalent which are based on a thoroughly wrong concept. The most untenable and harmful of these is the orthodontic appliance designed and made in the dental laboratory. By invitation, it becomes my privilege to present some truths proven through years by leaders in specialized practice.

(a) An orthodontic appliance is potent either for good or harm in the mouth. It has no inherent intelligence and can act only as mechanically directed. It cannot be beneficial unless it is correctly adjusted and this depends wholly on the intelligence and skill of the operator. If the appliance remains passive without regular adjustment and cleansing of the teeth, it is potent for harm to the patient and, therefore, to the dentist.

(b) The mechanisms made for dental restorations and those for orthodontic treatment are essentially different in purpose. Dental prosthetic appliances are substitutes for lost teeth and contiguous structures and their success is dependent upon the unchanging durability. They are intended and made to remain passive. Orthodontic appliances in order to produce results, must be active and regularly adjusted in order to maintain activity which is the essential factor in stimulating growth and structural changes in the jaw tissues necessary for improvement. They are successful only as they are capable of properly inducing teeth to move into normal positions. To accomplish this, orthodontic appliances must be progressively changed. This requires not only repeated re-shaping, but also the substitution and addition of parts as treatment progresses and this is much more difficult to accomplish with the bulky, low-grade mechanisms commonly designed and made in the dental laboratory. An orthodontic appliance is, therefore, not a passive, harmless thing in the mouth. It must result either in good or harm so long as it is worn. The dentist, and not the laboratory, is responsible to the patient and the outcome depends wholly on the ability of the practitioner.

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(c) Dentists are not schooled upon graduation to give orthodontic treatment. No dental college has ever claimed or even pretended to prepare its students in the undergraduate course for any kind of specialization. Therefore, the general practitioner is unprepared until he has mastered an adequate graduate or post-graduate course. Over thirteen university dental schools are now offering such courses in orthodontics.

(d) Proper diagnosis, case analysis, and treatment-planning are the first essentials to success. Seven steps are necessary as follows:

1. Personal examination of the patient is essential.
2. History—as complete as possible.
3. Thorough check-up of nasal region and air passages (by rhinologist) when indicated.
4. Complete set of intra-oral radiograms, supplemented by extra-oral when indicated.
5. Casts of teeth from accurate impressions.
6. Photostatic facial reproductions.
7. Graphs or plane reproductions of the casts—very helpful.

Not one step can be omitted without sacrificing thoroughness.

(e) Dental casts cannot possibly portray the conditions necessary for proper treatment-planning. This commonly prevailing practice by dental laboratories the nation over, is resulting in immeasurable harm to countless thousands of children. No orthodontist, worthy of the name, would think of assuming the responsibility of treatment without a personal examination of the patient and the weighing of all obtainable factors before proceeding. And it is inconceivable that any dentist, worthy of the name, would allow himself to undertake orthodontic treatment based on laboratory diagnosis and with appliances planned by a dental laboratory from casts only, after having been informed of the seven steps necessary for thorough diagnosis. The personal examination of the patient is invariably the first essential.

(f) Orthodontic appliances are only one of the seven recognized agencies in treatment. They should be used only when imperative and then worn for as short a period as is possible to produce satisfactory results. There are seven divisions of treatment as follows:

1. Physiologic—thorough use in mastication, deglutition, speech and breathing.
2. Psychologic—habit breaking, clear enunciation, thorough functioning.
3. Artificial exercisers—rubber bite straps.
4. Myofunctional therapy.
5. Medical aid, as by the pediatrist and rhinologist—patients should be referred whenever indicated.
6. Surgical—as removal of supernumerary and impacted teeth, exposure of impactions to aid eruption, cleft palate, cleft lip, etc.
7. Appliance therapy.

Treatment is frequently best given by a combination of exercises with appliances.

(g) The commercial dental laboratories are less to be blamed than those members of the dental profession who patronize them. The laboratories must not be censured for legitimately increasing their earnings. Their success is based upon the amount of money they can make and transfer from their business into their private accounts. They have no responsibility to the patient for the results produced by the mechanism they make. The dentist is fully responsible and his success must be based upon the good he can bring about for his patients. His financial reward ultimately depends upon this. The designing and making of appliances by the laboratory is the equivalent of diagnosing and prescribing treatment. Every orthodontist knows that this is impossible by the means legally available to the laboratory. It can only be the uninformed, unthinking and the unscrupulous practitioner who would attempt treatment under these absolutely inadequate conditions. It must be they that make profitable the "ads" for orthodontic appliances, otherwise laboratories would not pay for the space. The foregoing treatise has been prepared by invitation. The observation of fourteen years in general dental practice with an inclusion of some orthodontic patients, followed by almost a quarter century of exclusive specialization and teaching. The uncertainty, anxiety, and high percentage of failures in the early efforts of mixed practice are vividly remembered with repentance. There was, then, no adequate course of instruction available.

Orthodontics is recognized as a distinct branch of dentistry and is probably the most definitely defined specialty in dentistry. Only by concentration on orthodontics as an exclusive specialty has it been possible for its leaders to develop the high standards attainable today. More has been garnered and applied from colateral science than in any branch of dentistry. Excellence in daily practice has its basis in the fundamentals of biology. Success in treatment depends upon the scientific application of these to the problems of each individual case in stimulating growth, developmental and tissue changes in response to proper orthodontic treatment. Nothing less can, in the light of present knowledge, be recognized as true orthodontics worthy of its place as a specialty of forthright dentistry.

CHILD PSYCHOLOGY AND COMMON SENSE

By Joseph H. Kauffman, D.D.S.

Natural laws operate universally and although we study them to doomsday we can never arbitrarily change them. So it is with the actions and reactions of human beings; we are what we are, and until we become different we must govern ourselves accordingly. In the treatment of the youthful patient we should remember that these facts apply to us as well as to the children under our ministration; especially do they apply when considering the working of the human mind in relation to child care. Now that dentistry for

children is gaining ground, we find our literature and lecture platforms holding forth in many ways. One of these is the emphasis placed on the relationship of child psychology to the management of the young patient. We therefore take this opportunity of respectfully submitting some pertinent thoughts, solely with the purpose of simplifying what may appear, and is too often being made to appear philosophically complex.

The practical application of child psychology is synonymous with the use of common sense. Our crusaders will not hasten the promotion of dentistry for children if they become too pedantic about the child's mental status. It is bad enough to find so many in the profession lukewarm toward pedodontics for no sound reason, but to build up an idea that children generally are formidable obstacles replete with psychological abnormalities, is to make things worse. As a matter of fact, ordinary sense is sufficient to deal successfully with nine out of ten children, and if the tenth child does present a deviation requiring some special application on our part, such a case is the exception and not the rule. It certainly need not be a cause for great fussmaking.

At the bottom of any concept of child management lies the fundamental and irreplaceable requisite of love for children. Having that, the dentist is well prepared to meet every youthful visitor, and without that, all the psychology plus post-graduate courses, not to speak of under-graduate education, will be of little avail. Making an intensive study of child physcology for the earnest intention of advancing philosophical science has its place, beyond the shadow of a doubt; but no matter what we may learn about that subject from research and texts, the truth is that practice demands the use of common sense. The child does not theorize about the dentist; he just acts naturally, following the lines of his temperament and environment. The dentist should respond accordingly. If the dentist will treat a naturally reacting child as considerately as he would a naturally reacting adult, he will not have to stop to determine the youngster's intelligence quota or investigate his psychological classification as standardized by some well-meaning student of that subject. We do not do those things with our normal adult patients and it is not necessary to do them with our normal child patients. Let us make it easier and not harder.

Relevant to the matter of erudition on the state of the child mind, we can understand how sincere teachers and candidates for advanced degrees are endeavoring to amplify helpfully every phase of knowledge relating to pedodontics. In doing so, however, their tendency is often in the direction of abstract pedantry; unfortunately the addition of voluble talk and printed matter on child psychology has a numbing effect as far as the every day dentist is concerned. Since the general practitioner is the backbone of the profession, we must attract and not repel his interest. He is concerned with what is and not with what ought to be. To discuss the application of child psychology to child management just for the sake of saying something, does not mean a thing as far as he is concerned. We are reminded of the newspaper comment in which it was stated that an efficiency expert is a man who

is paid five thousand dollars a year for telling working girls how to live on twelve dollars a week.

The present day deluge of so-called "office psychology" is in reality the manifestation of an anxious desire to find some means of bolstering diminished practice which is at low ebb because of reduced national income and lack of public information on the value of dental health. It takes much more than a course in "patient psychology" to change a situation which is rooted in the above stated causes. This may seem blunt but it is nevertheless true. Similarly, attempting to make ourselves more useful to the children of our community will not be accomplished in any major way through the exaggerated considerations of child psychology. In plain words, a change of general economic conditions for the better and a more enlightened attitude of the layman toward the value of preventive dentistry, will bring more children to our offices — provided we really want them there. Once they arrive, our own sense of dentistry as a health service combined with a genuine love for the child will enable us to stop worrying about the supposedly overwhelming importance of scientific dissertations on the academic intricacies of the human mind. If we will show by act and deed a humane desire as dentists to do everything possible for the oral welfare of all children, and the enhancement of their general health and happiness, we will find that in the great majority of cases our minds and theirs will come together in an amicable and placid manner. Such a course will constitute a most practical demonstration of successful child management.

By all means let us learn what we can about different types of children and how to deal with them. But let us not build up imaginary obstacles by meeting every child as some theoretical problem in mental obstruction. Just let the child act naturally and meet conditions as they arise. Six words are sufficient to sum up the application of child psychology to dentistry for children: love the child and be yourself.

IS DECIDUOUS TOOTH DENTIN DIFFERENT FROM PERMANENT TOOTH DENTIN?

By Philip E. Blackerby Jr., A.B., D.D.S.

A scientific approach to the problems of cavity preparation, base materials, filling materials, and prognosis, in the treatment of caries of the deciduous teeth, as related to similar procedures with the permanent teeth, demands an accurate knowledge of the differences, if any, between the respective structural elements of these two dentitions. Such knowledge is essential if modifications of technic may be appropriately adapted to meet the different conditions presented by any structural variations that may exist. In this report, only one structural element, the dentin, will be considered, and the

findings based entirely upon a review of the literature pertaining to the characteristics of this tissue as it occurs normally in the deciduous and the permanent teeth of man.

General Description of Dentin

Noyes[1] defines dentin as a connective tissue whose intercellular substance is calcified. The structural elements of dentin may be stated as (a) the dentin matrix, (b) the sheaths of Neumann and the dentinal tubules, (c) the contents of the dentinal tubules or the dentinal fibrils. While these are the elements of which the tissue is composed, there are certain other characteristic appearances found in the dentin, caused by special conditions or arrangements of these elements. These are the granular layer of Tomes, the interglobular spaces, the lines of Schreger, and secondary dentin.

The dentin, like all of the other calcified tissues except the enamel, is a connective tissue and is formed by the dental papilla, which is a conical papilla of connective tissue, rich in blood vessels and covered on its surface by the layer of dentin-forming cells, the odontoblasts. The dentin is formed from without inward, leaving the remains of the dental papilla in the cavity of the formed dentin as the dental pulp.[1]

Tomes fibers, according to Orban,[2] are protoplasmic processes of the odontoblasts and may be traced from each odontoblast to the surface of the dentin. The dentinal tubules are the spaces in which the fibers run. Between the protoplasmic structures and hard substances we always find fluid, even if only in very small quantities. We may suppose that this is also the case in dentin. The Tomes fibers fill out the whole space in the tubules, but between the fibers and the wall of the tubules there may be a certain amount of fluid, most probably lymph.

In the calcification of the dentin the calcium salts are probably deposited by the odontoblasts in the form of globules. If the globules are very small and numerous and close to each other, they present a homogeneous appearance. If the globules are large and not so numerous, spaces of uncalcified matrix remain between them — the interglobular spaces. Since these interglobular spaces are signs of poor calcification, they are also indicative of disturbance in the calcium metabolism during development.[2]

Before the tooth is erupted, and up to the time that the full length of the root is formed, a characteristic thickness of dentin is formed, which is called the primary dentin. After this time dentin is formed by the pulp only intermittently, in response to irritations and trophic impulses, producing secondary dentin. Secondary dentin is always more irregular in the arrangement of the tubules, and more imperfect in structure than the primary dentin. The bounday line between two periods of dentin formation can always be picked out by changes in the direction or character of the dentinal tubules.[1]

Comparison of Deciduous Tooth Dentin and Permanent Tooth Dentin

(A) Gross Differences

Kronfeld[3] states that the dentin of deciduous teeth is structurally identical with that of the permanent teeth, except that it is thinner, in keeping with the smaller size of deciduous teeth. The pulp chambers are relatively large, a fact which is of considerable importance in cavity preparation for children.

The dentin of deciduous teeth is comparatively thinner and weaker than that of the permanent teeth, according to McBride.[4]

These obvious differences, in the comparative sizes of the deciduous and permanent teeth, have long been recognized as factors which call for the exercise of special precautions in deciduous cavity preparation and the insertion of filling materials, because of the relative proximity of the pulp to the tooth surfaces.

(B) Differences Related to Chronology

Kronfeld and Schour[5] have demonstrated the fact that only the deciduous teeth are in the process of calcification during the prenatal period, and that of the permanent teeth, only the first permanent molars begin to calcify during the neonatal period. Hence metabolic activities characteristic of fetal life affect the calcification of the deciduous teeth only, and the metabolic disturbances commonly occurring in the neonatal period produce their effets upon all the deciduous teeth, but not upon the permanent teeth, with the possible exeption of the first permanent molars. Furthermore, since calcification of the deciduous teeth is completed early in life, in comparison with that of the permanent teeth, the metabolic changes which take place postnatally, during infancy, and in early childhood, exert their influences upon permanent tooth development for a considerably longer period of time than upon that of the deciduous teeth. These differences in chronology, therefore, must be considered carefully in comparing the structural characteristics of deciduous tooth dentin and permanent tooth dentin.

Prenatally formed dentin (deiduous teeth only). According to the findings of Kronfeld and Schour,[5] in the histologic examination of approximately fifty complete jaws of infants and young children and the shed or extracted deciduous teeth of more than 600 additional children, the portion of the dentin formed prenatally showed uniformly good calcification. The prenatal dentin is invariably of homogeneous appearance without interglobular spaces. In utero calcification is not markedly affected by fluctuations in the condition of the mother, except perhaps in cases of grave maternal illness or a deficiency, such as osteomalacia.

The neonatal line. The discovery by Schour[6] of the neonatal line provided the basis for the differentiation histologically of prenatally and postnatally formed dentin. Histologic examination of human deciduous teeth, selected at random, reveals in the crown the presence of a distinctive incremental line in the enamel and a corresponding incremental line in the dentin, according

to Schour. In every case the lines appeared at a characteristic distance from the dentino-enamel junction, depending on whether the tooth examined was a deciduous central incisor, lateral incisor, cuspid or first or second molar. The lines could not be found in any of the permanent teeth that were examined except in the case of some permanent first molars. In these, the lines were confined to one or two cusps, usually the mesiobuccal cusp.

Birth and the neonatal period leave their mark in every deciduous tooth, according to Kronfeld and Schour.[5] The neonatal ring, a deficiency line, is present in every deciduous tooth, enamel and dentin, and is attributed by Kronfeld and Schour, as summarized by Brauer,[7] to the disturbance or shock to the child at the time of birth.

Postnatally formed dentin (deciduous and permanent teeth). Kronfeld and Schour[5] point out that after birth, the calcification of the teeth is very much influenced by the state of the infant's health. There are usually zones of disturbed calcification in the teeth, particularly from birth to 10 months, of age, which express the vicissitudes of the first few years of life. Interglobular dentin is found only in the postnatal portion of the deciduous teeth, but more or less uniformly throughout the dentin of the permanent teeth.

Age differences. Because of the fact that the deciduous teeth are retained for a relatively short portion of the individual's life, changes in the dentin which are produced as a result of age are manifested to a comparatively greater extent in the permanent teeth than in the deciduous dentition. G. V. Black,[8] as early as 1895, reported that there is practically a continuous increase in the percentage of lime-salts in the dentin, from youth to old age. The average specific gravity begins with 2.066 for the average age of 11 years and ends with the average of 2.109 for the average age of 63 years, according to Black's findings.

Bodecker[9] has found a considerable difference in the amount of inorganic salts contained in the dentin of the dentin calcified. In a more recent report, however, Bodecker[10] points out teeth of different ages. The older the individual becomes the more highly is that the deciduous teeth appear to mature more rapidly than the permanent teeth, particularly the first permanent molars, which mature slowly and remain highly permeable ten or fifteen years after their eruption. The crowns of the deciduous teeth seem to pass through their cycle of development quickly and reach complete maturity at the age of 8 to 10 years. The deciduous teeth are no so sensitive to the dental drill as those of the permanent dentition, according to Bodecker, but no histologic differences have been noted to account for such a clinical observation.

nent dentition, according to Bodecker, but no histologic differences have

Beust[11] reports that, whereas the dentinal tubules of the recently erupted tooth conduct fluids with eagerness and communicate them to the dentinal ground substance, in the teeth of the aged this conductivity has been reduced to nil, or is limited to isolated, well defined regions or exists only in the younger dentin in the immediate vicinity of the pulp.

An experimental investigation by Fish[12] revealed that the calcium content

of dentin is extremely stable, but that a normal physiologic increase takes place with age: slight physiologic additions may be made to it, but there is no evidence of any definite loss of calcium from the dentin under any circumstances.

Churchill[13] observed that this increase in calcification with age can be optically demonstrated by the increase in the transparency of the dentin; that the teeth of old people are often a wax-like transparency in their apical portions; and that in ground sections the more highly calcified parts show less affinity for stains, such as fuchsin, and appear lighter.

Kronfeld[3] summarizes these age differences with the statement that the amount, appearance and structure of the dentin change throughout the life of the tooth. The formation of dentin continues throughout life as long as the pulp is intact. As a result, the dentin becomes gradually thicker and the pulp chamber and root canal smaller. In youth all dentinal tubules contain living Tomes fibers. With advancing age some of the tubules become obliterated by calcium salts, their vital contents are lost, and these areas then appear denser than the surrounding dentin. This condition is called sclerosis of the dentin. In very old teeth almost all of the dentin may be sclerotic.

On the basis of the findings reported above, it appears that the dentin of deciduous teeth is most similar in structure and appearance to the dentin of young permanent teeth, but that older permanent teeth show certain changes in calcium content, permeability, specific gravity and appearance which may be attributed directly to their greater age and which are not found in deciduous and young permanent teeth because of their relatively lesser age.

(C) Differences in Physical and Chemical Properties

The differences in physical and chemical properties which may be demonstrated between deciduous tooth dentin and the dentin of permanent teeth are closely associated with the relative ages of these tissues, and have been described to some extent in the previous section on age differences. Boyd, Drain and Deakins[14] reported that the specific gravity of 191 slabs from permanent, non-carious teeth was 2.00 and that the average specific gravity of 51 deciduous teeth showing no cavities was 1.91. They pointed out further that in most of these teeth the roots were completely resorbed so that this value was for coronal dentin and may, therefore, be slightly higher than an average value for whole teeth. They conclude, however, that this represents a significent difference between the specific gravity of permanent and deciduous teeth. Black[8] had previously reported a comparable difference in specific gravity (2.092 for permanent teeth and 2.076 for deciduous teeth).

In regard to permeability, which is largely determined by the proportionate amount of inorganic salts present in the dentin, and upon the age of the tooth, Bodecker[15] states that the dentin is most permeable in the teeth of young individuals and that this permeability is progressively reduced after adolescence. The Scientific Research Committee of the Dental Society of the State of New York[16] also described the dentin in the teeth of children as highly permeable.

Differences in the chemical properties of deciduous and permanent tooth dentin are summarized by Hodge and his associates[17,18] as follows: deciduous dentin has a higher average organic content than the permanent dentin; and the permanent tissue appears to be slightly more calcified than the deciduous. The differences noted, in moisture content and in organic content, are characterized as not statistically significant. The findings of Lefevre and Hodge[19] and Black,[8] on studies of whole teeth, are in agreement with these reports. However, it is concluded[17] that the chemical differences between deciduous and permanent dentin are much less striking than the near identity of their composition. Here again the factor of age differences must be taken into consideration in comparing the chemical composition of these tissues.

(D) Secondary Dentin

Brauer,[7] Ireland,[20] and Kronfeld[3] state that secondary dentin formation is found in both the deciduous and permanent dentitions. Kronfeld points out, however, that there is little secondary dentin formation in the deciduous teeth because of the fact that these teeth are shed before they are much worn. If a deciduous tooth is retained for a long time after its normal time for shedding, then it may be considerably worn down and its pulp chamber obliterated by secondary dentin formation, according to Kronfeld.

(E) Embryological Differences

Schour[21] states that the permanent molars arise, like deciduous teeth, from the dental lamina, while the other permanent teeth develop from buds of their deciduous predecessors. Thus an embryological difference is demonstrated between the dentin of deciduous teeth and the dentin of all permanent teeth except the first, second and third molars.

Summary

Certain differences between deciduous tooth dentin and the dentin of permanent teeth have been reported, as follows:

1. Deciduous tooth dentin is thinner, in keeping with the smaller size of the deciduous teeth.
2. Part of the deciduous tooth dentin is formed prenatally, and this portion is of a more homogeneous and better structure than the postnatally formed portion of the deciduous dentin and the dentin of the permanent teeth, all of which is calcified after birth.
3. The so-called neonatal ring is present in the dentin of all deciduous teeth, but not in the dentin of the permanent teeth, with the possible exception of the first permanent molars.
4. That portion of deciduous tooth dentin which is formed postnatally is most similar to the dentin of permanent teeth.
5. Deciduous tooth dentin has a lower specific gravity, a lower water content, and a greater permeability than the dentin of permanent teeth, but these differences are almost nil with the young permanent teeth, increasing progressively with the increased age of the permanent teeth.
6. Secondary dentin formation takes place in both the deciduous and

permanent dentitions, but to a somewhat greater extent in the permanent teeth because of their greater average age attainment.

Deciduous tooth dentin is derived from the dental lamina, as is the dentin of the permanent molars, but the dentin of the succedaneous permanent teeth is derived from buds of their deciduous predecessors.

Conclusions

1. Certain differences exist between the dentin of deciduous teeth and that of the permanent teeth.

2. These differences are very slight and, for the most part, are only of academic importance.

3. Most of the existing differences may be attributed largely to the differences in size, chronology and average age attainment between the deciduous and permanent teeth.

4. The differences between deciduous and permanent tooth dentin, with the exception of the difference in thickness, are of little if any clinical significance, in connection with the operative procedures of the dentist.

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ORAL SURGERY FOR CHILDREN

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The first of our responsibility in minor oral surgery for children is a macroscopic picture of the individual oral cavity. Are the gum tissues in a healthy condition, or are they inflamed? Do we have gingivitis or stomatitis and what is the cause? Are we dealing with a possible Vincent's infection? All of these conditions are of great importance; especially, in sick and undernourished children.

What are we going to find upon roentgenographic examination: are we dealing with vital teeth or teeth wherein the pulp has been destroyed; have we any rarefied areas to deal with, or are there any granulomas or cysts present? Are the constitutional symptoms present the result of disease or only associated with it?

The discovery of some pathological state of the gum margin or alveolar process of the jaw is not sufficient evidence in itself to conclude that the pa-

tient's health is suffering therefrom. It must be admitted that bodily ill health may have its origin in oral disease, but care must be exercised in determining which, if any, of the symptoms have their origin in a disease of the mouth. It must be born in mind that many general diseases have distinct manifestations in the mouth and should be recognized by the dental practitioner. A good rule to follow in taking case histories is to learn whether or not the dental history antedated the medical history. If the dental history came before, the infected teeth are more likely to be the cause of the systemic disturbance; provided, all other foci have been removed.

The cause of inflammation is either physical, chemical or bacterial. Since bacteria are by far the commonest cause of the inflammation met with in surgical practice, the addition of trauma can easily lead to a cellulitis or osteomyelitis. We, therefore, must have the field as clean as possible for the operation with the least amount of trauma. Since children do have diabetis, heart lesions, anemia, or a tendency to bleeding, preoperative considerations should be kept in mind. Any of these types of children are a poor risk and the advice of their physicians should be sought.

The judgment of both physician and dentist should decide as to the extent of surgical procedure, proper medication, type of anesthesia and the possibility of hospitalization. Most of these cases are a poor risk in the average dental office. Preoperative care in acute and subacute infections is highly important. Either establish drainage through the tooth; or, if it has reached the stage of subperiosteal abscess, incise and drain. After drainage is established, the mouth should be kept clean by the frequent use of a suitable mouth wash. If possible, avoid operating on a child that has a cold, a sore throat, fever, or digestive disturbances.

The protection of the throat in a child during extraction is essential as a tooth may leave the forceps and lodge in a bronchial tube. By far the greater part of minor dental surgery on a child is the removal of broken down deciduous teeth and roots. This type is most always infected and may be acute or chronic. The acute type should be localized and drained before any surgery is attempted.

The roots that are most apt to give us trouble are those of maxillary and mandibular deciduous molars. This is due to the particular dental anatomy of these roots, the mesio-distal diameter of which is very small. When broken at, or below, the gingival, such teeth can not be removed with forceps.

Care must be taken not to disturb the bicuspids and permanent first molars, which lie near these roots. If elevators are used, one may easily deliver the molar, or one of the bicuspids; particularly, is this true if any of these teeth have partially erupted. We therefore, make it a practice to use the No. 14, 15, 16, and 17 spoon excavators, as the force that can be exerted on these instruments is not apt to be great enough to deliver a permanent tooth. By gradually working the instrument along the mesial or distal of the root, as the case may indicate, these roots can be loosened and removed without damage to the permanent tooth.

When operating on a child that is nervous, it is good practice to premedicate such an individual: ¾ grain of seconal, or ¾ grain of nembutal one-half hour before the operation will eliminate a good deal of such nervousness. Should you want faster action, puncture both ends of the capsule with a pin before administering the drug. This drug should be administered in either type of anesthesia, local or general.

The field of operation should be kept clean; the patient should be told to keep the mouth open and not expectorate during the operation. The field should also be packed with gauze packs during the operation. As soon as the surgery is completed, fill the cavity, or socket, with powdered sulfanilamide. In doing this, do not wipe out the blood from the socket but let it form a paste with the drug; then, have the patient bite down on a gauze pack for the next fifteen minutes. The child should be kept as quiet as possible for the next twenty-four hours—do not allow the rinsing of the mouth during this time.

The patient should eat easily digested foods and partake of fruit juices in large amounts. If fruit juices are not available, the child should drink considerable water. Impress upon the mother that the child's bowels must be kept open. If the child should need a cathartic, prescribe the one you wish him to have. So many parents are apt to give a child a patented remedy which should by all means be discouraged.

Due to the activity of the child, post-operative hemorrhage is not infrequent. There should be no washing or cleansing of the mouth for the first twenty-four to forty-eight hours. During a small hemorrhage, the clots should be wiped out with a sterile piece of gauze. A pressure pack of sterile gauze is often sufficient to control the hemorrhage. At times, it may be necessary to crush the bone in the bleeding area: this can be done by tapping a blunt instrument, with the mallet, or by the use of a hemostat.

The use of Monsel's solution is contra-indicated, as the clot formed by sesquichloride of iron comes away quite easily and bleeding starts again. Fer de lance snake venom placed on the end of a cotton roll and packed in the socket has proven very satisfactory in most cases. After having the socket packed, the patient should be placed at perfect rest, sitting upright, with pillows placed in position to keep the child from the reclining position. Keep the patient in a cool room with cold applications to the jaw. Cold has a tendency to constrict the blood vessels, which is desirable during hemorrhage.

THE CARE AND PRESERVATION OF THE LABORATORY ORIGIN*

Juanita Wade, D.D.S.

There are so many things of importance in dentistry for children, that it is hard to select one part and discuss it separately; and yet from an educational viewpoint, I believe there is none quite so important as the treatment and care of the first permanent molar areas. Most likely to caries in the first permanent molar are the buccal and linqual grooves, the deep grooves of the occlusal surface, and the mesial surface. These are the points to which we must give our most careful attention.

We, who entered the dental field twenty-five years ago thought we could prevent loss of the first permanent molar by directing our efforts toward finding and filling the defective pit and fissures. Now, we know that preventive measures must begin with advice to the expectant mother during the prenatal period, followed by intelligent care in regard to the health and nutrition of the child. Here we should stress cooperation with the medical profession, particulary obstetricians, to have the diet necessary to development of well formed teeth in the mouths of our children.

This brings up to the question of growth and development of the first permanent molar. Every dentist should know this in order to answer two questions: first, "Why should my child have cavities in new teeth when I have fed him vegetables and fruits and given him cod liver oil regularly?" second, "Do teeth decay from the inside? I cannot see any cavities and they never ache." With the use of the Bodecker Chart and a fine explorer, we attempt to answer the questions in lay language. This chart showing progress of decay in occlusal enamel fissures is a most valuable aid in visually educating the parent to the need of correct service. If on examining these molars, the explorer sinks into the fissure to any depth or a definite catch is felt, a good occlusal cavity should be prepared. Let us not be guilty of saying that this defect will be all right, to wait for six months until the cavity becomes larger. You do not know how much damage and doubt you cause by such false and misleading statements to parents and children. Often parents and children are becoming educated faster than some of our operators.

The first step in the local care of the first molar is to make certain that the distal surface of the second deciduous molar is in a healthy condition and to see that the permanent molar has erupted in its proper position. Often the first molar erupts very slowly, being partly covered by gum tissue for some time and this prevents thorough cleansing of the grooves. Particularly if the opposing tooth has not yet erupted. This invites caries. Some advocate the early removal of this tissue, thorough cleaning of these grooves and cor-

*Read before the Texas Unit of the A.S.D.C.

rection of the fault in the tooth.

The questions asked in the correction of these pit and fissure defects are: "Will the application of silver nitrate preserve the teeth?" or, "Do you think these teeth should be protected by a cement wash after their eruption," or "Do you believe the tooth should be filled?" Some operators feel that they have successfully used a silver nitrate precipitation in these fissures. However, Dr. James M. Prime, who has done much work with ammonical nitrate, says that pits and fissures cannot be sterilized with this solution. Caries begin at the dentino-enamel junction and the silver nitrate solution will not reach that point. Similarly, forcing cement into fissures may be beneficial in the hands of some but from my own experiences, I have found that this is not successful in preventing caries.

It is the concensus that correction of these defects is none other than the operative removal of the fissure and a permanent restoration of the tooth to form and function. This care or treatment of fissure defects has been defined in a new term "prophylactic odontotomy," originated by the Hyatt Study Club. The need for this method of treatment for the deeply fissured surfaces can be realized when we recall that cavities attack this surface in more than double the number of all other surfaces together. A survey made by the Hyatt Study Club gave the startling information that only one permanent molar in 2200 survives the age of 12 without requiring filling. This can be readily accepted by any of us who have worked with children for any length of time.

The technic for the preparation of precarious fissures is simple. First, the the fissure is opened with a #33½ inverted cone bur, extending the cavity the full length of the central groove and including the mesial and distal pits. Failure to follow out fissure faults is the major cause for filling failures.

Follow this with an inverted cone bur #34 and a #557 cross-cut fissure bur. Ordinarily this last bur will complete the preparation, sufficiently sharpening the angles, flattening the floor and paralleling the walls so that further retention is unnecessary. The cavity can be seated sufficiently at the dentino-enamel junction but one must have sufficient width in order to condense the amalgam. Should the defect penetrate into the dentin a small rould bur #1 or #2 is used to remove the decalcified portion. Care should be taken that after drying the area thoroughly, there is no white line visible; for often under this decalcified area one will find a large area of caries. If such a condition exists the cavity must be extended.

As a newly erupted tooth is very sensitive, only the most necessary operative work should be done. Extensive procedures, such as insertion of large gold foil fillings, are contra-indicated. Because the pulps are large and vascular, development may be interfered with. However, when a patient reaches the age of ten, gold foil can be used if the roots of the tooth to be filled are thoroughly formed. No set rule can be given by which we may pre-determine the result of the application of any operative method. Gold inlays are used very successfully in the first permanent molar, however many operators prefer amalgam.

So often I have found the term "prophylactic odontotomy" confused with "immunization." Immunization may be resorted to when the defect does not penetrate the entire thickness of enamel, or when the tooth has very high pointed cusps. Immunization is the grinding of a pit and fissure so as to transform it into a shallow groove in which food debris will not cling. I have encountered only a few teeth where this process may be used successfully.

Whenever defective areas are found in the lingual and buccal grooves they should be immediately cut out, sterilized, and filled with a permanent filling material — gold foil or silver amalgam. Often I have seen extensive caries in buccal pits, as usually the buccal surface is two-thirds covered by the buccal gum tissue. This buccal tissue is soft and quite free from the tooth, making an excellent lodging place for food. Therefore, the importance of careful frequent prophylaxis should be stressed.

In caring for the first permanent molar, the mesial surface should be examined thoroughly at regular intervals. Polishing of the proximal surface with tape and cleaning paste or with regular prophylactic strips is very effective and should be routine in prophylaxis during the transitional period. In my practice I have lost more molars from caries on this surface because so often the pulp is endangered before the patient has any warning of trouble. This brings us to the importance of often taking bitewing X-rays for our child patients. Frequently a defect is discovered long before it could be detected with any explorer.

The preservation of the mesial surface has been explicitly explained by one of our noted writers, Dr. George Morgan. He points out that there is six years difference between the eruption of the first molar and of the second bicuspid. During these six years we find trouble with the mesial surface of the molar. Now, as the first step to protect this mesial surface, we should see that the distal surface of the second deciduous molar is not etched or carious. If it is, this condition should be improved by either polishing the etched surface and treating it with ammonical nitrate, or if caries has occurred, the tooth should be filled with amalgam or gold. Second, there should be treatment of the mesial surface of the first permanent molar from the time of its eruption to exfoliation of the second deciduous molar. After the eruption of the first permanent molar, we may expect to find caries on the distal surface of the second deciduous molar and the mesial surface of the first permanent molar. If the cavities are small they can be treated in the following manner: First, prepare the distal surface of the second deciduous molar for a compound disto-occlusal filling. This will provide access to the mesial surface of the first permanent molar, which can then be prepared as a simple proximal cavity. This cavity is then filled with silver amalgam which may be changed after the exfoliation of the second deciduous molar to gold foil. At the next sitting, the filling on the mesial surface of the first permanent molar can be polished and the cavity in the deciduous molar filled with silver amalgam. Third, treat the mesial surface of the permanent molar from the exfoliation of the second deciduous molar, to the eruption of the second

bicuspid. During this period one has an excellent view of the mesial surface. If there is etching, ammonical nitrate can be used successfully, followed by the polishing of this surface. More frequently, we find caries and the cavity should be filled with gold foil. If the cavity is large enough to undermine the mesial margin, a gold inlay should be used to restore the occlusal and mesial surface.

I may say here, if any are interested in the use of ammonical nitrate on the proximal surfaces, that you read some of Dr. James Prime's articles. At present, I have a number of children under observation for whom I have applied this solution regularly for a number of years, following with bitewing X-rays at regular intervals. Please understand that I am not using this promiscuously. I am very careful in my selection of cases, getting the etched surface before it is visible to the eye. If decalcification has progressed sufficiently to show in the X-ray, prospects of successfully arresting or stopping the process with this solution are not good.

When a dentist works on children who have not been periodically recalled he is constantly confronted with pulp management in young permanent molars. In young molars we may excavate layer after layer of leathery dentin and come to a brown dentin that appears comparatively firm. The question arises: should the pulp be capped, should the pulp be removed, or should the tooth be extracted? It has been our routine practice for several years to reduce a fresh solution of ammonical silver solution over the brown dentin, following this with the reducing agent Eugenol. The area is then dried and a paste of chemically pure Zinc Oxide cement is applied and allowed to remain for a period of a few months. During this time a secondary calcification occurs in the dentin. Later, the temporary filling is removed and the stained dentin is excavated before a permanent filling is placed. Radiographic check-ups have shown formation of this secondary dentin.

Dr. Bodecker in his article, "Histologic Evidence of Benefits of Temporary Fillings," says that the greatest benefit is obtained when the pulp does not receive a severe shock, which results on preparing a deep seated cavity completely. If a temporary filling has been placed, the pulp has had an opportunity to build a protection wall of secondary dentin slowly which is a better secondary dentin than when it is hastily layed down. This secondary dentin has far less permeability than the first dentin.

To show the need for early care of the first permanent molar, let me state the following: less result in cavities, occlusal disturbances, and changes in facial contour or, frequently, in interference with speech and general physical growth and development. The fact that the boy or girl at fifteen averages almost two first molar extractions is proof that periodic dental examination and treatment must begin as soon as these important teeth erupt.

The Best Age for Treating Malocclusion*

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Sometime ago I realized the extent of work covered by this title. There seems to be no limit to the number of papers and books published dealing with this subject, and the difference in opinion of various investigators and writers is as great as the publications are numerous, the writer has endeavored, however, to follow the recognized authorities — and in different places has quoted statements made by them. If a few contradictory thoughts are found — they should be examined with an open mind and weighed as to merit (if any) for who can say which is right, for a dogmatic attitude is not acceptable in the scientific approach to Orthodontia, and the treatment of Orthodontic cases. It is sincerely hoped that those who hear this paper and view the illustrations, will realize that the objective has been improvement, and not perfection.

For quite a number of years considerable attention has been given to the correct time for beginning the correction of children's mouth-deformities and straightening of their teeth. Not only has this been done by the dentist and Orthodontist, but by the layman as well. Often we hear of a man who has asked his family dentist the proper time to begin with his boy or girl for straightening their teeth, and has been advised to wait until the child is twelve or fourteen years of age to begin this correction, and not infrequently do we hear, that if they are left alone nature will correct these cases. As a result of this, prolonged cases of Orthodontia are being done on these children, which could have been prevented if they had been properly advised, and the results are not so satisfactory as they could have been had these cases been started at an earlier period.

It seems that the most opportune time to begin the treatment of a case of malocclusion varies with each individual. In years past it was not uncommon to hear the statement made that treatment should not be undertaken until the child was about twelve years of age. Why twelve years was chosen is difficult to understand. By that age all the permanent teeth with the exception of the third molars are erupted, or at least partially so; and their positions of malocclusion are definitely established. In fact, waiting until about twelve years of age to undertake treatment means simply that the malocclusion invariably had developed to its worst. In the past few years, however, Orthodontists and several dentists seemed to feel that the earlier the treatment the better. Because of the possibility of retarded growth in the very young, however, this viewpoint may be open to some question. What appears to be a malocclusion at five or six years of age may become, through natural forces, at eight or nine years just the reverse. Children do not grow constantly, and there are often long periods of growth retardation which hinder the establishment of normal occlusion. Habits in early life will often give

*Read before the Texas Unit of the A.S.D.C.

characteristic molocclusions, which, upon breaking the habit, seem to improve remarkably. The spacing that usually occurs at five or six years of age between the deciduous teeth may not become evident until a year or two later. It may not appear at all. Loosening of the deciduous teeth through normal root absorption may be considerably delayed. Therefore, there is no doubt that the treatment problem, as with normal occlusion, is individualistic in character and that no set time for even a particular type of case can be stated as ideal.

Prevention of malocclusion is the ideal desire where this is possible, and a proper diagnosis with X-ray and study models should be had before giving our patients advice, either to have them corrected at once or to have a waiting period. Often, however, we find cases that have waited until twelve or fourteen years of age before presenting themselves to the dentist or Orthodontist for correction; and in these cases the desirability, even the necessity of treatment for the improvement of the appearance, may be so great that it is better to treat the case after age twelve than to leave it as it is, and allow the patient to grow up a conspicuous object, if the patient, parent and Orthodontist are convinced that the advantages thus gained are greater than the disadvantages which will accrue from a later treatment. Even then the prognosis of such cases is not so good as in the younger children.

It is my belief that tooth movement can and should be accomplished in such a way that the functional relationship will not be disturbed and that period which we are pleased to call retention period should be reduced to a minimum, some of us are rather prone to overdo the word normal function, but taking into consideration the elasticity of the bones and surrounding structures, normal function can be produced in the young child while using the foundation molars as our agents for stabilization of bands and appliances, much easier than in older cases.

Risk of injury to permanent teeth and associated tissues is reduced, if the deciduous teeth are used as agents in the treatment, instead of the permanent ones. If Orthodontic treatment could be confined to the deciduous dentition, there would be no question about harm to the permanent teeth, peridental membrane, etc., as the result of appliances. Harm to the teeth and soft tissues may be caused by badly made, adjusted, and cared for appliances; as regards others, against which no indictment is possible. Is there an Orthodontist who would claim that the wearing of orthodontic apparatus is desirable per se; better not to have a dentition which requires such. But if it is necessary to wear appliances then the least our patients are entitled to demand is that such risk be reduced to a minimum, and in a number of cases the least risk is incurred by using the deciduous teeth in preference to the permanent teeth as our agents in the treatment. Frequently the treatment can be completed, excepting perhaps the final retention, before the loss of the second deciduous molars.

If the Orthodontic problem is regarded as an Orthopedic one; and surely it is, for we are dealing with the development of the boney structure of the

jaw and the development of muscles surrounding, and attaching themselves, to these surrounding boney structures, then the precepts governing Orthopedic treatment, and Orthodontic treatment, are synonymous and apply thus: The earlier that treatment the greater its success. When Orthopedic surgeons have to treat bone deformities, they prefer to treat them as soon after the development of the deformity as possible, but in addition and like ourselves, the Orthopedic surgeons have also suffered, or perhaps I should say, their patients have suffered, because they, the patients, were told to wait until such and such a time before submitting to treatment.

I would like at this time to refresh your memory in regards to the roots of the deciduous molars and their possibility as agents in the correction of Orthodontic cases. What I mean by this is, that for a few years some of us have not been placing enough stress upon this phase of our work as we should. At any rate things which are not constantly brought to our mind often fall off the hook of our memory. The deciduous or foundation molars will aid considerably in the correction of cases of malocclusion "provided" the root growth is sufficient to cause stimulation to the deeper structures such as bone and muscle tissue and the crypts of the permanent teeth. If, however, the roots have been partially absorbed when treatment is begun, we will be very much disappointed at the results of our case. X-Ray diagnosis at this time is a very important phase of the treatment and will show what we should expect if we decide to place an appliance and start the case. I would like here to quote from Dr. Strange on the treatment of malocclusion of the teeth; "After the permanent Incisor teeth have completely erupted, lateral growth of the jaw practically ceases, while their forward and vertical growth should become quite marked. Hence in cases where it has seemed wise to delay the mechanical stimulation of the lateral growth and in which this growth fails to materalize, so that the permanent incisors have erupted and remain in mal-allignment, it is now good judgment to inaugurate active care. Yet if the examination shows that the buccal section of the upper dental arch has been moved mesially to such an extent that the crypts of the upper canine teeth are overlying the roots of the lateral incisor, it is unwise to correct the mal-allignment, and treatment should be postponed. Such a delay of mechanical interference is justified for the following reason: Moving the deciduous molars distally at this time will not take the crypts of the permanent premolars and canines with them because the roots of the deciduous molars, at least those of the first deciduous molars, are too far absorbed to influence the underlying crypts of the premolar teeth and there is no possible way of overcoming the mesial position of the canine crypt, hence when all the permanent teeth erupt, they will assume a location mesial to normal in spite of the early treatment and *consequently* will have to be carried distally by mechanical aid in the form of rather prolonged secondary period of treatment, so we see that there are many factors to consider before deciding just when to begin active mechanical interference in a mouth that shows even marked malocclusion at an early age."

Now let us consider for a moment the axial inclination of the permanent teeth, especially the axial inclination of the Cuspids, which have remained in their mesial position after the deciduous molars and canines have been moved distally and as said before fail to be moved backward due to the lack of stimulation from the roots of the deciduous teeth. The author believes, after study, that the apical third of the root of the upper Canines is one of the most stable landmarks in denture anatomy, for the following reasons:

(a) It is located in fairly dense bone underlying the attachments of the facial muscles and so deep that the play of the muscle when acting normally is not felt with sufficient influence to displace this portion of the tooth.

(b) It is formed late in denture history and consequently disturbing environmental forces have not been active upon this part of the tooth for a long period of time.

(c) It is a portion of the longest root in the entire tooth series and naturally such a root resists displacement more strenuously than all other teeth. And too, at it's eruption, it is so dominant during this process, it will move anterior teeth together and sometimes will force the approximal teeth out of line in order to gain the place where it rightfully belongs.

Such a complication, with reference to the proper time to treat Orthodontic cases should certainly be given serious consideration, for prolonged cases or constant wearing of Orthodontic appliances is not the best method of treatment especially when such can be avoided by a thorough knowledge of the underlying structures, and just why they respond or fail to respond to active stimulation from an appliance. On the other hand, should the careful survey find that the deciduous roots have ample growth to cause the proper stimulation, and this stimulation does cause the permanent crypts to be moved distally as the deciduous teeth are moved, all such teeth, whatever their movement, will remain in their new and, shall I say, correct position. This will and does aid the permanent teeth in their correct eruption, as under normal conditions they follow the positions of the deciduous teeth, as, they make their appearance in the arches. These permanent teeth are laid down in the positions that they are to finally occupy, and are not subjected to artificial stimulation except the very little which perhaps is necessary to retain them. Such treatment, whereby the formation of the root is completed by allowing the remainder of the root to be formed and laid down in this position, where it will be in normal relation, must be of greater advantage to the well being of the tooth itself as well as the tissues involved.

If the family dentist has carefully supervised the care of the deciduous teeth, doing all in his power to safeguard them and protect them individually and collectively, and has established the little patient on a regimen of oral hygiene, the child, when necessary, will go to the Orthodontist under the most favorable circumstances. If the Orthodontist then pursues his work with a full sense of his responsibility, not only for the actual Ortho-

dontic work, but also from his general supervision of the mouth and teeth while the work is being done, the patient will come through in the best possible manner.

When evidence of malocclusion is present to the general practitioner, he is usually inclined to call the situation to the attention of the parent and explain the circumstances, using models for purposes of illustration. If he feels that the natural forces present in the cases seem to indicate that nature will bring about the desired improvement, he will advocate a waiting policy and make periodical observation. If he is convinced that Orthodontic treatment is essential, he will refer the patient promptly to the specialist in the full confidence that frank and unbiased opinion will be forthcoming. If the decision is in favor of treatment, the conditions which make the treatment necessary should be stated, and if the case is to rest without Orthodontic interference, reasons for that decision and tentative prognosis could be given.

The statement that too much Orthodontia is being done is occasionally heard, and has come not only from parents and practitioners of general dentistry, but also now and then from pediatricians. Just what this statement means is an open question, but the assumption is that it means that some cases which really do not need appliances are taken by the Orthodontist and placed under active treatment, thereby commercializing his profession. However, I want to say here, that I believe there is only one-third of the Orthodontia done that should be done.

Up to this time, we have dwelled too much perhaps on the early phase of Orthodontic treatment, but nevertheless are aware of the large amount of adult Orthodontia which is being done by the Orthodontist and general Dentist, who choses to do this. We have tried in a preceding portion of this paper to justify this and realize that it is absolutely necessary in a few cases, this does not or should not entail extensive tooth movement. The most important phase of Orthodontics, and especially that phase of treatment which is paramount in the minds and endeavor of those interested in the promotion of children's dentistry, is preventive Orthodontia.

Many difficult problems confronting us could be eliminated if preventive Orthodontics were more thoroughly understood and practiced by all dentists who do work for children. Under such conditions true denture guidance might supplant much of the salvaging, now necessary on the part of the Orthodontist and simplify the placing of artificial restorations.

The dentist wishing to include children's work in his practice, should by no means fail to gain proper knowledge required to recognize incipient deformities and acquaint himself with growth and development of the face and jaws and the rearrangement which takes place in these parts, from time to time. Most facial deformities seen by the Orthodontist are so advanced as to be easily recognized, for usually the parent brings the child because it is evident that something is wrong. Incipient deformity is rarely noticed by the parent and often is overlooked or misjudged by the dentist,

unless he is able to discriminate between deformity and normal stage of development. Therefore, knowledge of the changes that occur with growth in the face and dental arches, and the stage of development expected for any given age and sex, must be part of the equipment of every dentist who would practice any phase of Orthodontia, or dentistry for children, as it does and probably always will occur, regardless of the dentist desire to practice prevention.

The subject of preventive Orthodontia can be carried far into the night, and a volume written about this very important phase of dentistry, but time will not permit too much study of it here. To make the information we have usable, let us resolve to put it more and more in our practice, for by doing so it will be of more interest to us and benefit to our patients. Each and every one of us are interested in them for the benefit they may derive from our knowledge, and because they are our life. Therefore, if they are to get the most out of our guidance and instructions, we should not fail to take an inventory of ourselves, and if we feel that they need the services which we do not do, or care to do, we should not fail to suggest this service, explaining why we would like to refer them for this work, and stating just why the reference is made. In almost every case, in matters of general health, there will be a closer professional tie between the dentist and the patient and a profound respect of the father and mother for such professional judgment.

WHY HAVE CERTAIN DENTAL HEALTH EDUCATIONAL PROGRAMS FAILED?*

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The fact that the Iowa Dental Health Educational Plan has been effective in the majority of counties and communities within the state since 1927 warrant an analysis of this success, as well as the failures it has had in a few counties, cities and towns. This year there are 87 out of 99 counties active, as well as over 500 city, town and parochial schools. Over 260,000 children have been under the influence of this dental health program and many others have indirectly benefited.

The above facts are of tremendous significance and importance, not only to dentistry, but to the public and schools. The program has been carried year after year and in those counties, cities and towns where it has been active it has the support of the educational leaders, the public and the profession.

The development of an effective dental health educational program necessitates the cooperation of the dental profession in the local communities, the teachers, and the public. Failures have been evidenced in certain counties,

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cities and towns because these three could not get together. In most instances the dentists or teachers were the ones not willing to cooperate. The result was the lack of a well-organized dental health program.

The Dental Profession

The dentists in some communities have refused to cooperate in certain cases because they were not prepared to work for the child, or because they were too old to renew their interest in dentistry as it is practiced today. Such dentists are not too old in years, but too old in the same routine of life. Some teachers and school superintendents have said, "Why should we continue to teach the child concerning dental health and the relative needs, when the dentists will not see or work for the child?" The above statement has been made time and time again in the State of Iowa during the past year, and it is a serious charge against dentistry. However, it is not only true in Iowa, but in other states there seems to be this problem. Where shall the children go in such communities where they are so unfortunate as to have such a dentist.

There are a few dental societies or society committees which have been a bit too agressive in the formulation of plans on dental health education without the consultation of all interested parties. The county, as well as the city superintendent and the nurses and associated groups, should by all means help form the educational plan which they shall be expected to use. For the greatest possible success and cooperation, all individuals concerned or affected should be consulted in the development of any plan. This has not always been done, and failure is easily invited.

The Teaching Profession

Occasionally the Bureau of Dental Hygiene representatives encounter a county or city superintendent who is living far in the past or is too self-satisfied. Some superintendents have been in certain school systems so long that they have lost all initiative and any progressive or new idea is cast aside. A false sense of values is also evident in a few instances where the school executive will question any expense, even though little, for the teaching of health. The argument concerning teaching loads is occasionally mentioned as an excuse for not accepting some plan for dental or general health education. To such superintendents could well be said, "One thing should come first in life—Health. It is placed and valued above all. Without health all the education at one's command is of little avail, and the richest man on earth is indeed poor without health. It is true that reading, arithmetic and geography are important, but above all, the knowledge of the principles of health is of greater significance." The teacher is an important unit in the success of an educational program, and unless he is progressive and cooperative, little can be done and that community which does not have progress and cooperation from its teaching profession will have to remain in darkness until a future day.

Unfortunately many new teachers are not acquainted with our Iowa

Dental Health Education Program, since such instruction is not given to many teachers. This is particularly true of the out-of-state educated teachers.

Many colleges at the present time are now teaching the objectives and points of our program and do present the necessary information. Also, all normal training students in Iowa in the high schools are now required to know the essential points concerning the Iowa Plan. This qualification for prospective teachers will do much to stabilize and stimulate this phase of teaching.

The Public

In very few instances has the general public been a negative factor. It is true that in some communities the relative family income is so small that a large percentage of the people cannot afford the desirable services in dentistry or medicine. In virtually every town or city, however, there is an appreciable percentage of parents who will afford a reasonable service, if such service is available. Some parents have been told by their dentists for so long that dentistry for children is not necessary that it is now difficult in some cases to make the father or mother believe otherwise. The lay individuals in such cities or towns will not be very interested in the development of an educational plan for dentistry unless this concept of dentistry is markedly changed for them.

Summary

These and other factors handicap the Bureau of Dental Hygiene or any other agent from a more complete realization in health education, but in no case is the situation hopeless. Each year barriers are broken down with new schools, new towns, and new individuals realizing health principles as essentials of life. Iowa should and will be a leader in the promotion of health; and teachers, dentists and physicians will rise to greater heights education; a grand record has been established. There is still work to be done, however, and the communities that are now lagging behind can, with a little effort, be adjusted.

NEWS AND VIEWS

Secretarial Message

The Secretary of the parent body wishes to solicit the assistance of all the Secretaries of the State Units in the following matter. It is my desire as secretary to co-ordinate closely the membership records with those of the State Units. Such a comparison will enable us to correct any errors due to human fallicies and in many instances find members within a State who have not associated themselves with the State Unit. I therefore request that each Unit Secretary send to my office by June 1st a list of their membership and an indication thereon as to what members are new since September, 1940.

Book Reviews

The following books, while not dealing directly with children's work, are hot off the press and brim full of data which any dentist may find need for either regularly or on special occasions. Both come from the house of Mosby.

Textbook of Exodontia by Winter. Dr. Leo Winter, professor of Oral Surgery at New York University, has just issued the fourth edition of his book.

If a picture is worth a thousand words, and if seeing is believing, then this book provides a liberal education the easy way for between its covers are 475 illustrations. Many of the illustrations are actual photographs but whether they be photographs, enlarged X-rays, headplates, or sketches they are of sufficient size and dimension to vividly depict the thought or procedure in mind.

The book deals liberally with local and general anesthesia, discusses the so-called exodontic approach, considers extractions in general, impactions, fractures and cysts. A particularly new departure is his chapter on sulphanilamide whih deals with its routine use in his practice this past year. According to his text Dr. Winters now uses sulphanilamide after all surgical operations including removal of cysts and impactions, and for post operative infections and dry sockets.

Theory and Treatment of Fractures of the Jaws by Boyle. This text comes from Britain the author, Horace Boyle, having been a Captain in the British Army Medical Service and dental surgeon to the ministry of pensions. His treatise includes the treatment of war wounds and principles of plastic surgery as well as that which the title indicates.

His book gives liberal credit for the opinion of others for he discusses the general use and specific designs of numerous appliances, including the Fowler apparatus, the Carter wiring method, the Gunning, Hirn, Tomes, Kingsley, Hammond, Payne, Guy, Baker and Winter splints, the Angle fracture bands and cast occlusal appliance, as well as bandages of all types including the staple plaster of paris type. He gives consideration to the treatment of young children with their attending nursing problems and the difficulty of using the deciduous molars for retaining splints.

The English nonuse of our letter "Z" becomes very obvious as one pursues this text for such words as specialised, recognised, and mobilisation look peculiar spelled with an "s." Perhaps however it may be common only to this author.